

Computer Specifications

Main System Board

System memory	8MB RAM standard on two 4MB SIMMs; expandable using 1MB, 2MB, 4MB, 8MB, 16MB, or 32MB single- or double-sided SIMMs up to 128MB (maximum); SIMMs must be 80ns, 36-bit, 72-pin, tin-plated, fast-page mode type; 16MB and 32MB SIMMs may be 70ns, 36-bit, 72-pin, tin-plated, fast-page mode type
BIOS	256KB on two 128KB FLASH EEPROM devices for system and video BIOS
Shadow RAM	Automatically copies the system BIOS from ROM into RAM; shadow RAM addresses for video BIOS and external BIOS are software selectable
Video RAM	512KB
Clock/ calendar	Real-time clock, calendar, and CMOS RAM for BIOS use; battery backup; contents can be cleared to default values by jumper setting

CPU Card

CPU	Intel 486DX2, 66 MHz microprocessor; simulated 8 MHz processor speed selectable through software or keyboard command
Cache memory	8KB internal cache in the 486DX2/66 microprocessor; 128KB Intel cache module with write-through, two-way set associative cache memory and controller
OverDrive processor	486DX2 microprocessor on CPU card can be replaced with optional Intel OverDrive processor or CPU card can be replaced with Intel Pentium CPU card

Interfaces

Monitor	15-pin, D-shell analog connector
Serial	Two RS-232-C, 9-pin, D-shell connectors; asynchronous
Parallel	25-pin, D-shell connector; supports IBM AT compatible or PS/2 compatible (bidirectional) signals; software selectable
Mouse	Mini DIN, 6-pin connector for PS/2 compatible mouse or other pointing device
Keyboard	Mini DIN, 6-pin connector for PS/2 compatible keyboard
Option slots	Eight 32-bit EISA bus master expansion slots (16-bit and 8-bit ISA compatible)

Speaker Internal; operation controllable by software

Keyboard Detachable, two position, 101 or 102 sculpted keys; country-dependent main typewriter keyboard; numeric/cursor control keypad; four-key cursor control keypad; 12 function keys

Controllers

Diskette Controller on the main system board supports up to two diskette drives in any of these formats:

5¼-inch, high-density, 1.2MB
5¼-inch, double-density, 360KB
3½-inch, high-density, 1.44MB
3½-inch, double-density, 720KB

Hard disk Interface on the main system board supports up to two IDE drives with embedded controllers

Video VGA controller supports standard VGA resolutions

Mass Storage Bays

Up to nine half-height devices maximum; two 1-inch high internal bays for IDE or SCSI hard disk drives; four half-height or two full-height internal bays for SCSI hard disk drives; three half-height externally-accessible drive bays

Physical Characteristics

Width 8.5 inches (21.5 cm)
9.5 inches (24.1 cm) including feet

Depth 23 inches (58.4 cm)

Height 20.4 inches (51.8 cm)

weight 44.5 lb (20 kg) with one diskette drive only

Power Supply

Type 230W, fan-cooled, switch-selectable voltage

Input ranges 100 to 120 VAC and 200 to 240 VAC, 50 to 60Hz

Maximum current At 115 Volts, 5 Amps; at 230 Volts, 4 Amps

Output cables Four main system board cables; nine mass storage power cables

5 Volt current limitation

To determine the maximum allowable amperage of your option cards and other equipment, use the table below. It lists the typical system 5 volt current drain for your main system board and other components. Check the 5 volt amperage rating of the equipment you install and make sure the total system amperage does not exceed 30 Amps.

System current drain

Component	+5V amperage (typical)	+12V amperage	-12v amperage
Main system board	3.5A	.06A	.06A
Total installed memory on SIMMs	4tvlB 2.0A 8 M B 2.1A 64MB 2.4A 128MB 2.8A		
CPU card integrated cache	2.5A		
3.5inch diskette drive	0.9A		
IDE hard disk drive	0.34A	1A at boot 0.4A running	
SCSI hard dii drive	0.75A	2Aatboot .53A running	
EISA optionslot *	2.0A		

- Each EISA option slot is rated at 4.5A per slot, however average current consumption for all slots used should not exceed 3A per slot. Most E ISA option cards draw 2A. If you install a card drawing more than 2A, install it in a lower numbered slot (such as 1 or 2) to ensure adequate cooling.

Maximum outputs


output voltage (VDC)	Maximum continuous current (Amps)	Minimum load	Peak surge	Watts
+5	30A	11A	30A	150W
-5	0.5A	0A	0.5A	2.5W
+12	6A	0.5A	8A	72W
-12	0.5A	0A	0.5A	6.0W

Environmental Requirements





Condition	Operating range	Non-operating range	Storage range
Temperature	50° to 95° F (10° to 35° C)	-40° to 149° F (-40° to 65° C)	-4° to 140° F (-20° to 60° C)
Humidity (non-condensing)	85% at 104° F (40° C)	95% at 131° F (55° C)	20% to 95% at 131° F (55° C)
Altitude	To 10,000 ft (3048 m)	To 10,000 ft (3048 m)	To 10,000 ft (3048 m)
Static Discharge (ESD)	0-5KV (no errors) 5KV-12KV (no hard errors)	12KV-25KV (no damage)	N/A
Acoustical noise	45 dB at 25° C	N/A	N/A

Power Source Requirements

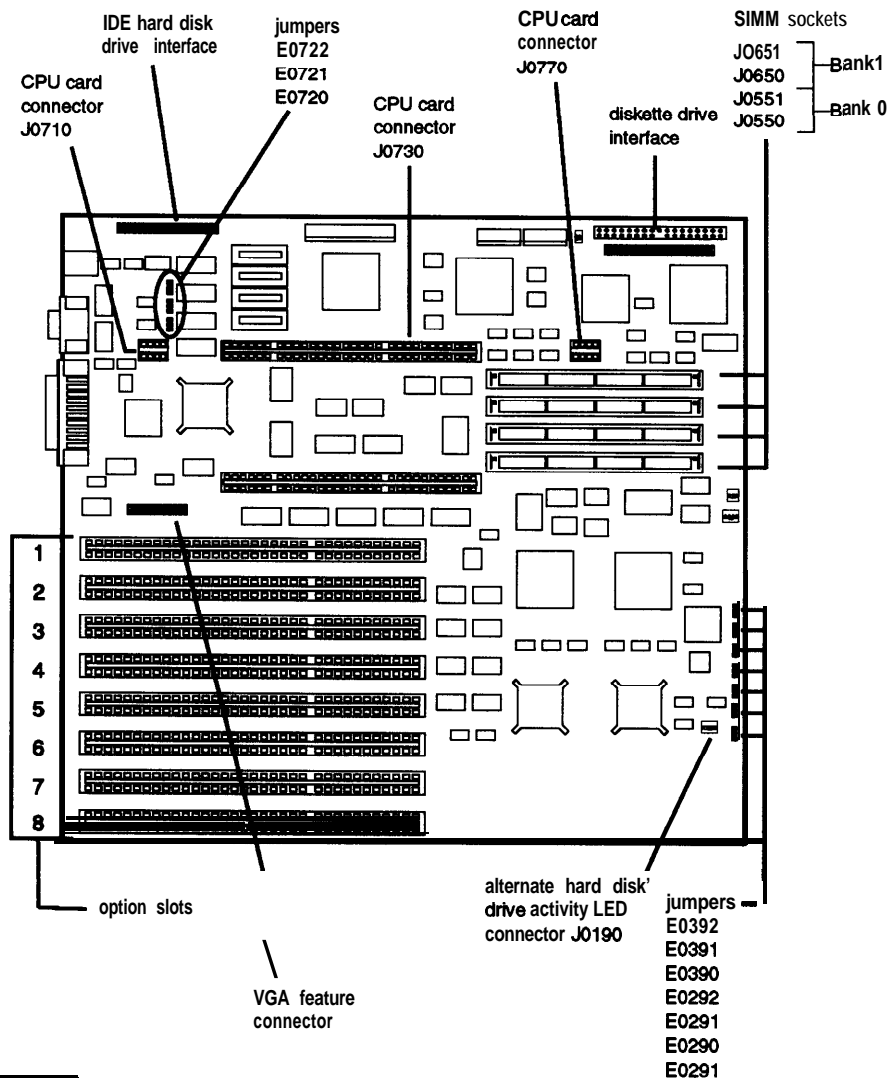
120-Volt power source requirements

AC plug	Plug type	Reference standard	Power cord
	North America 125V, 10A	ANSI C73.11, NEMA 5-15-P, IEC 83	UL/CAS Listed, Type SJT, no. 18/3AWG, or no. 16/3AWG, or <HAR> 300V, 10A or 13A

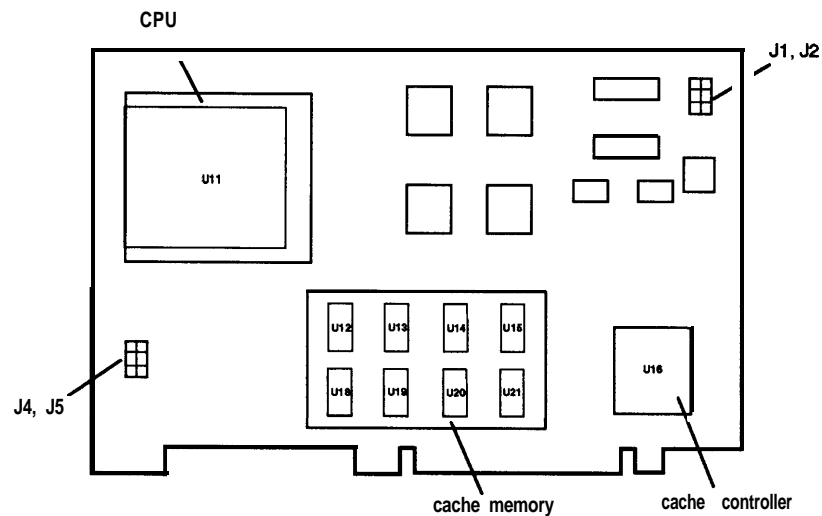
240-Volt power source requirements

AC plug	Plug type	Reference standard	Power cord
	Europe 240V, 10A to 16A	CEE 7/7 IEC 83 IEC127 HD 21	<HAR> 1.00 mm ² 300V, 10A
	UK 240V, 10A	Bs 1362 BS 1363A IEC 83 IEC 127 HD 21 EN 60 320-I ASTA mark	<HAR> 1.00 mm ² 300V, 10A
	Australia 240V, 10A	ASCI12 IEC 127 HD 21	<HAR> 1.00 mm ² 300V, 10A
	North America 240V, 15A	ANSI C73.20, NEMA 6-1 5-P, IEC 83 UL 198.6	UL/CAS Listed Type SJT no. 18/3AWG, 300V, 10A

Main System Board Map

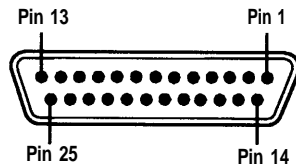


Processor Board Map



Connector Pin Assignments

Parallel Port Connector (J0600 top)

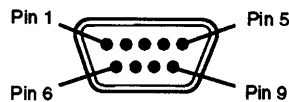


Parallel port connector pin assignments

Pin	Signal	Pin	Signal	Pin	Signal
1	STROBE	10	ACK*	19	SIGNAL GND
2	DATA0	11	BUSY	20	SIGNAL GND
3	DATA1	12	PE	21	SIGNAL GND
4	DATA2	13	SELECT	22	SIGNAL GND
5	DATA3	14	AUTO*	23	SIGNAL GND
6	DATA4	15	ERROR*	24	SIGNAL GND
7	DATA5	16	INIT*	25	SIGNAL GND
8	DATA6	17	SELECTIN*		
9	DATA7	18	SIGNAL GND		

*Active Low Logic

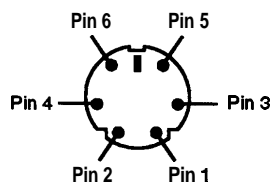
Serial Port Connectors (J0700)



Serial port connection pin assignments

Pin	Signal	Pin	Signal
1	Data Carrier Detect	6	Data Set Ready
2	Receive Data	7	Request To Send
3	Transmit Data	8	Clear To Send
4	Data Terminal Ready	9	Ring Indicator
5	Ground		

Keyboard and Mouse Connector (J0801 and J0600)



Although the keyboard and mouse connectors are physically identical, they cannot be used interchangeably.

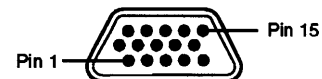
Keyboard connector pin assignments

Pin	Signal	Pin	Signal
1	Keyboard Data	4	+5 VDC (fused)
2	NC	5	Keyboard Clock
3	Ground	6	NC

Mouse connector pin assignments

Pin	Signal	Pin	Signal
1	Mouse Data	4	+5 VDC (fused)
2	NC	5	Mouse Clock
3	Ground	6	NC

VGA Port Connector (J0601)

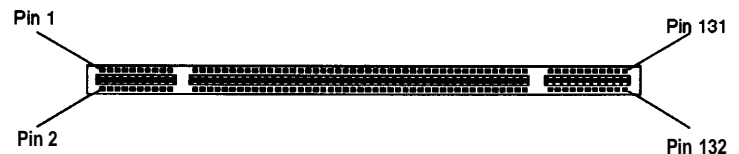


The VGA port connector (J0601) is a 15-pin, D-shell, female receptacle, accessible from the rear of the computer.

VGA port connector pin assignments

Pin	Signal	Pin	Signal	Pin	Signal
1	Red	6	Ground	11	NC
2	Green	7	Ground	12	NC
3	Blue	8	Ground	13	Horizontal Sync
4	NC	9	NC	14	Vertical Sync
5	Ground	10	Ground	15	NC

CPU Card Connector (J0730)



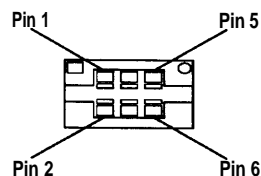
CPU card connector pin assignments

Pin	Signal	Pin	Signal
1	Hard Reset	2	Ground
3	Bus Grant	4	Soft Reset
5	Bus Request	6	NC
7	+5 VDC	8	Refresh Request
9	Allow 20 Mask	10	Refresh Demand
11	NC	12	Reset Numeric Processor Exception Error
13	Cache Flush	14	Ground
15	Write Modified Cache Entries	16	Interrupt Request 13
17	Maskable Interrupt	18	Nonmaskable Interrupt
19	+5 VDC	20	Cache Data Modified
21	Snoop Status Available	22	Snoop Strobe
23	Write Through/Write Back	24	Write Protect
25	Memory Speed 0	26	Ground
27	Memory Speed 1	28	Memory Area Cacheable
29	Lock	30	Response 0
31	+5 VDC	32	Response 1
33	Status 0	34	Ready
35	Status 1	36	Force Access Termination

CPU card connector pin assignments (continued)

Pin	Signal	Pin	Signal
37	Status 2	38	Ground
39	Ground	40	Address Strobe
41	CAS Latch Even	42	Ground
43	CAS Latch Odd	44	Odd Memory Bank Select
45	Ground	46	Even Memory Bank Select
47	Byte Enable 1	48	Ground
49	Byte Enable 3	50	Byte Enable 0
51	Address Bit 3	52	Byte Enable 2
53	Address Bit 5	54	+5 VDC
55	+5 VDC	56	Address Bit 2
57	Address Bit 7	58	Address Bit 4
59	Address Bit 9	60	Address Bit 6
61	Address Bit 11	62	Ground
63	Address Bit 13	64	Address Bit 8
65	+5 VDC	66	Address Bit 10
67	Address Bit 15	68	+5 VDC
69	Address Bit 17	70	Address Bit 12
71	Ground	72	Address Bit 14
73	Address Bit 19	74	Address Bit 16
75	Address Bit 21	76	Address Bit 16
77	Address Bit 23	76	+5 VDC
79	+5 VDC	60	Address Bit 20
61	Address Bit 25	62	Address Bit 22
83	Address Bit 27	84	Address Bit 24
85	Ground	86	Address Bit 26
87	Address Bit 29	88	Ground
89	Address Bit 31	90	Address Bit 28
91	Ground	92	Address Bit 30
93	Data Bit 1	94	Ground
95	Ground	96	Data Bit 0
97	Data Bit 3	98	Data Bit 2
99	Data Bit 5	100	Data Bit 4
101	Data Bit 7	102	+5 VDC
103	Data Bit 9	104	Data Bit 6
105	Data Bit 11	106	Data Bit 8
107	Ground	108	Data Bit 10
109	Data Bit 13	110	Data Bit 12
111	Data Bit 15	112	Data Bit 14
113	Data Bit 17	114	+5 VDC
115	Data Bit 19	116	Data Bit 16
117	Data Bit 21	118	Data Bit 18
119	Ground	120	Data Bit 20
121	Data Bit 23	122	Data Bit 22
123	Data Bit 25	124	Data Bit 24
125	Data Bit 27	126	+5 VDC
127	Data Bit 29	128	Data Bit 26
129	Data Bit 31	130	Data Bit 28
131	Ground	132	Data Bit 30

CPU Card Power Supply and Ground Connectors (J0710 and J0770)



CPU card power supply and ground connector pin assignments

Pin	Signal	Pin	Signal	Pin	Signal
1	+5 VDC	3	+5 VDC	5	+5 VDC
2	Ground	4	Ground	6	Ground

DMA Channels

DMA channels

Channel	Function
0 (CTRL 1)	Spare (8-bit)
1 (CTRL 1)	Spare (8-bit)
2 (CTRL 1)	Diskette drive controller (8-bit)
3 (CTRL 1)	Spare (8-bit)
5 (CTRL 2)	Spare (16-bit)
6 (CTRL 2)	Spare (16-bit)
7 (CTRL 2)	Spare (16-bit)

System Interrupts

System interrupts

IRQ	Device
NMI	Parity error
0	Reserved, interval timer
1	Reserved, keyboard buffer full
2	Reserved, cascade interrupt from slave PIC
3	Onboard serial port 2 (COM2), if enabled
4	Onboard serial port 1 (COM1), if enabled
5	LPT2, if enabled
6	Onboard diskette drive controller, if enabled
7	LPT1, if enabled
8	Real-time clock (RTC)
9	User definable; can be set for EISA option cards using the ECU
10	COM3, if enabled; can be set for EISA option cards using the ECU
11	COM4, if enabled; can be set for EISA option cards using the ECU
12	Onboard PS/2 mouse port, if enabled
13	Reserved, math coprocessor
14	IDE hard drive controller, if enabled
15	User definable; can be set for EISA option cards using the ECU

Input/output Addresses

Input/output addresses

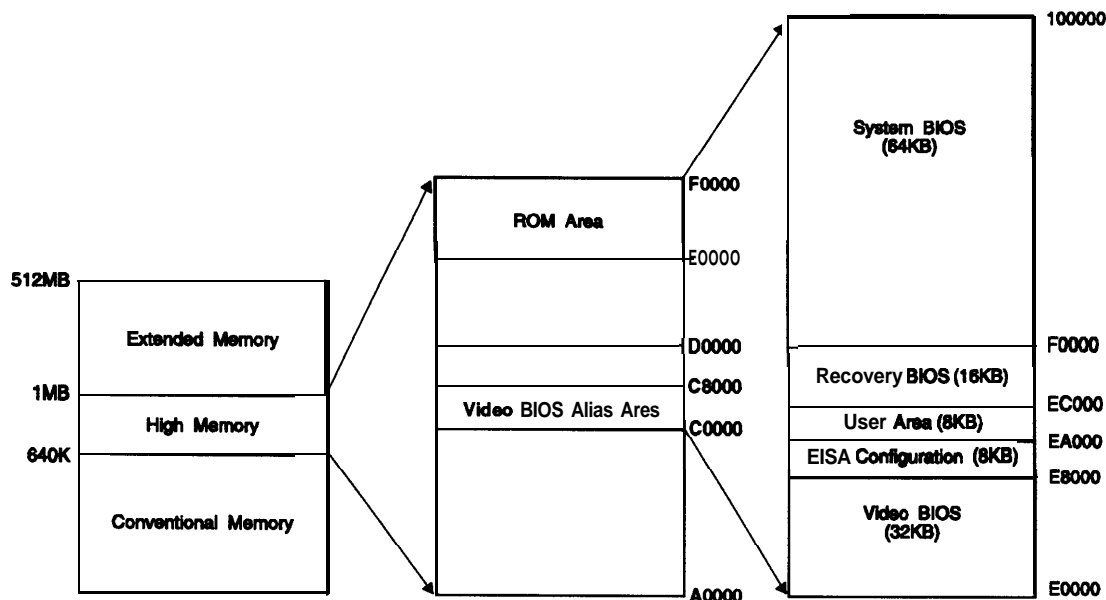
I/O address	Device
000 - 00F	Slave DMA controller 1
020 - 021	Master interrupt controller 1
026	Configuration controller index registers
027	Configuration controller data registers
040 - 043	Interval timer 1
048 - 04B	Interval timer 2
060, 064	Keyboard/mouse controller
061	NMI and diagnostic port
070	Real-time clock
070	Enable NMI
071	Real-time clock
078	BIOS loop timer
080 - 08F	DMA page register
092	System control port
0A0 - 0A1	Slave interrupt controller 2

Input/output addresses (continued)

I/O address	Device
OCO-ODE	Master DMA controller 2
0F0	Reset numeric coprocessor
0F8 - 0FF	Numeric coprocessor
1F0 - 1F8	IDE hard drive controller
278 - 27B	Parallel port 2 (LPT2); parallel port 3 (PS/2-compatible)
2C0 - 2DF	Clock calendar
2E8 - 2EF	Serial port 4 (COM4)
2F8 - 2FF	Serial port 2 (COM2)
378 - 37F	Parallel port 1 (LPT1); parallel port 2 (PS/2-compatible)
3B0 - 3BB	WDQOC31 onboard Video registers
3BC - 3BE	Parallel port 3 (LPT3); parallel port 1 (PS/2-compatible)
3BF - 3DF	16C552 registers
3E8 - 3EF	Serial port 3 (COM3)
3F0 - 3F5	Onboard diskette controller
3F6	Onboard IDE hard drive controller
3F7	Onboard IDE read
3F7	Onboard diskette controller read/write
3F8 - 3FF	Serial port 1 (COM1)
400 - 40B	Extended DMA controller 1 registers
40C - 40F	Extended control/test registers
461 - 464	Extended NMI register
464 - 465	Extended bus master
480 - 48F	Extended DMA page register
4C2 - 4CE	Extended DMA 2 registers
4D0	Extended interrupt 1
4D1	Extended interrupt 2
4D4	Extended DMA 2 chaining
4D4	Extended DMA 2 write mode
co2 - co4	System baseboard configuration information
C80 - C83	System baseboard EISA ID register
C84	System baseboard enable
C85 - C87	Reserved

System Memory Map

Starting address	Hex address range	Size	Function
0KB	00000h to 07FFFh	512KB	Base memory
512KB	80000h to 9FFFFh	128KB	Base memory enabled in SETUP or the EISA Configuration utility
640KB	0A0000h to 0BFFFFh	128KB	Video display RAM
788KB	0C0000h to 0C7FFFh	32KB	Offboard video ROM BIOS (can be shadowed)
800KB	0C8000h to CFFFFh	32KB	Adapter ROM BIOS extensions (can be shadowed)
632KB	0D0000h to DFFFFh	64KB	Adapter ROM BIOS extensions
896KB	0E0000h to 0E7FFFh	32KB	Built-in video BIOS ROM (can be shadowed or mapped to 0C0000h)
928KB	0E8000h to EQFFF h	8KB	EISA Configuration data
936KB	0EA000h to 0EBFFFh	8KB	Reserved memory area
944KB	0EC000h to 0EFFFFh	16KB	Recovery BIOS area
960KB	0F0000h to FFFFFh	64KB	System BIOS area
1MB	100000h to FFFFFFFh	15MB	Extended memory area
Top of System Memory	0C8000h to 0DFFFFh	96KB	Reserved for ROM and RAM expansion boards



Jumper Settings

See the Main System Board Map on page 4 for the location of the jumpers on the main system board.

Main system board jumper settings

Jumper number	Description	Jumper setting	Function
E0191	FLASH memory	1 to 2* 2 to 3	Normal boot Enables FLASH memory BIOS for recovery operation
E0290	Video controller	1 to 2* 2 to 3	Enables onboard video controller Disables onboard video controller so you can install a video controller on an option card
E0291	Diskette write-protection	1 to 2 2 to 3*	Enables write-protection (read-only mode) for any diskette drive connected to the built-in controller Enables read-write capability (read/write mode) for any diskette drive connected to the built-in controller
E0292	NVRAM	1 to 2* 2 to 3	Normal non-volatile RAM operation Changes EISA configuration or SETUP values stored in non-volatile RAM to their default values
E0390	Password	1 to 2 2 to 3*	Disables and clears the power-on password Enables power-on password operation
E0391	SIMM Bank 0	1 to 2* 2 to 3	1MB, 2MB, 4MB, or 8MB SIMMs are installed in Bank 0 16MB or 32MB SIMMs are installed in Bank 0
E0392	SIMM Bank 1	1 to 2* 2 to 3	1MB, 2MB, 4MB, or 8MB SIMMs are installed in Bank 1 16MB or 32MB SIMMs are installed in Bank 1
E0721	FLASH memory write protection	1 to 2* 2 to 3	Enables writes to FLASH memory using the EISA Configuration utility or the SETUP program Disables writes to FLASH memory
E0722	Video controller base address	1 to 2 2 to 3*	Moves video controller starting address to 03C3H if you installed a card or application program that uses address 46E8H Starting video controller address is 46E8H

* Default setting

CPU Card Jumpers

The PowerSpan comes with a CPU card. Set the jumpers on the card according to the table below.

CPU card jumpers

CPU card processor	J1	J2	J4	J5
66 MHz DX2	1-2	1-2	1-2	1-2
OverDrive P24T	1-2	1-2	1-2	1-2

OverDrive Modules

You can install an Intel P24T OverDrive processor on the CPU card.

SIMM Installation

There are four SIMM sockets organized in two banks on the main system board. You can install 36-bit, tin-plated, fast-page mode, single or double-sided SIMMs with a capacity of 1MB, 2MB, 4MB, or 8MB running at 70ns or a capacity of 16MB or 32MB running at 70ns or 80ns. Check the following guidelines to ensure that you choose the correct type of SIMMs and install them properly:

- ☐ Use only 36-bit, tin-plated, fast-page mode, single- or double-sided SIMMs that operate at an access speed of 70 or 80 nanoseconds (ns). You can install 1MB, 2MB, 4MB, or 8MB 80ns SIMMs and 16MB or 32MB 70ns SIMMs.
- ☐ Fill each bank with two SIMMs of the same size.
- ☐ Install SIMMs in Bank 0 first (sockets J0550 and J0551). Then use Bank 1 (sockets J0650 and J0651).

The table below lists some sample memory configurations. You can install SIMMs in many different configurations than those listed in the table.

SIMM configurations

Bank 0		Bank 1		Total memory
J0550	J0551	J0650	J0651	
4 MB	4 MB			8 MB*
4 MB	4 MB	1 MB	1 MB	10 MB
4 MB	4 MB	4 MB	4 MB	16 MB
8 MB	8 MB			16 MB
8 MB	8 MB	4 MB	4 MB	24 MB
8 MB	8 MB	8 MB	8 MB	32 MB
16 MB	16 MB			32 MB
32 MB	32 MB			64 MB
32 MB	32 MB	16 MB	16 MB	96 MB
32 MB	32 MB	32 MB	32 MB	128 MB

*Standard memory configuration

Power-on Diagnostic and Boot Errors

When the power-on diagnostic tests detect an error, the computer displays a message on the screen (as described below) and the speaker beeps twice. If the error occurs before the computer initializes the video display, the speaker sounds a series of beeps.

Each error is identified by a message number and a countdown number which the computer uses as it executes the test associated with the error.

The table below lists the power-on diagnostic and boot error messages, and some basic solutions to the problems.

Power-on diagnostic and boot error messages

Countdown number	Error message number	Message	Solution
840		Start of power-on diagnostics	Not an error
830		CPU register test	Not an error

Power-on diagnostic and boot error messages (continued)

Countdown number	Error message number	Message	Solution
820		8742 Initialization	Not an error
810	810	Real-time clock RAM and register test failure	Contact your dealer
800	800	System BIOS checksum test failure	Contact your dealer
790	790	Programmable interval timer failure	Contact your dealer
780	780	DMA channel failure	Contact your dealer
770	770	DMA page register test failure	Contact your dealer
760	760	RAM refresh failure	Contact your dealer
740	740	First 64KB RAM chip or data line failure—bit 0	Contact your dealer
	741	First 64KB RAM chip or data line failure—bit 1	Contact your dealer
	742	First 64KB RAM chip or data line failure—bit 2	Contact your dealer
	743	First 64KB RAM chip or data line failure—bit 3	Contact your dealer
	744	First 64KB RAM chip or data line failure—bit 4	Contact your dealer
	745	First 84KB RAM chip or data line failure—bit 5	Contact your dealer
	748	First 84KB RAM chip or data line failure—bit 8	Contact your dealer
	747	First 84KB RAM chip or data line failure—bit 7	Contact your dealer
	748	First 84KB RAM chip or data line failure—bit 8	Contact your dealer
	749	First 84KB RAM chip or data line failure—bit 9	Contact your dealer
	750	First 84KB RAM chip or data line failure—bit 10	Contact your dealer
	751	First 84KB RAM chip or data line failure—bit 11	Contact your dealer
	752	First 84KB RAM chip or data line failure—bit 12	Contact your dealer
	753	First 84KB RAM chip or data line failure—bit 13	Contact your dealer
	754	First 84KB RAM chip or data line failure—bit 14	Contact your dealer
	755	First 84KB RAM chip or data line failure—bit 15	Contact your dealer
	758	First 84KB RAM chip or data line failure—multi-bit	Contact your dealer
	757	First 84KB odd/even logic failure	Contact your dealer
	758	First 84KB address line failure	Contact your dealer
	759	First 64KB RAM parity test failure	Contact your dealer
	700	Shadow of system BIOS failed	Contact your dealer
	701	Shadow of onboard video BIOS failed	Contact your dealer
	702	Off-board video BIOS not found	Contact your dealer
	703	Onboard video BIOS conflict at C0000H	Contact your dealer
	704	Fatal onboard video BIOS conflict at C0000H	Contact your dealer
	705	Onboard video BIOS conflict at E0000H	Contact your dealer

Power-on diagnostic and boot error messages (continued)

Countdown number	Error message number	Message	Solution
	706	Fatal onboard video BIOS conflict at E0000H	Contact your dealer
890	890	CMOS power failure	Run SETUP or the ECU; contact your dealer if the problem persists
	691	CMOS checksum failure	
	692	Extended CMOS checksum failure	
	693	Default configuration failure, unable to write to FLASH memory (Note that this error will be displayed after video has been initialized.)	
680		Initialize EISA slots	Not an error
670		Initialize serial ports	Not an error
660		Initialize parallel ports	Not an error
655	655	DMA register failure (slave)	Contact your dealer
650	650	DMA register failure (master)	Contact your dealer
645	645	Programmable interrupt controller register test failure (master)	Contact your dealer
640	640	Programmable interrupt controller register test failure (slave)	Contact your dealer
620		Initialize interrupt vector table	Not an error
810		Enable timer tick interrupt	Not an error
800	800	Keyboard controller failure	Check the keyboard connection; if it is connected, the keyboard controller may have failed; contact your dealer
590		Check video configuration	Not an error
570	570	VGA/EGA configuration error	Run SETUP or the ECU; contact your dealer if the problem persists
540	540	VGA/EGA BIOS failed to initialize	
520		Initialize console redirection	Not an error
500		Display sign-on messages	Not an error
490	490	No timer tick interrupt	Run SETUP or the ECU; contact your dealer if the problem persists
480	480	Shutdown failure	Contact your dealer
460	460	Fail-safe timer NMI failure	Run SETUP or the ECU; contact your dealer if the problem persists
	461	Software port NMI failure	
450		Chip initialization 8	Not an error
440	440	Gate A20 failure	Contact your dealer
	441	Unexpected interrupt in protected mode	The system received an interrupt while in protected mode (probably while testing memory); contact your dealer if the problem persists
430	430	Timer 2 failure	Run SETUP or the ECU; contact your dealer if the problem persists
390		Initialize keyboard flags	Not an error
370	370	Keyboard controller failure	Check the keyboard connection; if it is connected, the keyboard or controller may have failed; contact your dealer if the problem persists
	371	Keyboard clock line failure	
	372	Keyboard data line failure	
	373	Keyboard stuck key failure	
	374	Keyboard failure	

Power-on diagnostic and boot error messages (continued)

Countdown number	Error message number	Message	Solution
350		Reinitialize keyboard controller	Not an error
330		Initialize auxiliary device	Not an error
310		Initialize keyboard controller output port	Not an error
300		Initialize gate A20	Not an error
290	290	Memory parity failure at <i>nnnn:0000</i> to <i>nnnn:FFFF</i>	One of the SIMMs or its associated circuitry failed; make sure all SIMMs are installed correctly; contact your dealer if the problem persists
	291	Memory data line failure at <i>nnnn:0000</i> to <i>nnnn:FFFF</i>	
	292	Memory odd/even logic failure at <i>nnnn:0000</i> to <i>nnnn:FFFF</i>	
	293	Memory double word logic failure at <i>nnnn:0000</i> to <i>nnnn:FFFF</i>	
	294	Memory high address failure at <i>nnnn:0000</i> to <i>nnnn:FFFF</i>	
	295	Memory address line failure at <i>nnnn:nnnn</i> , Read <i>nnnn</i> Expecting <i>nnnn</i>	
	296	Memory read/write failure at <i>nnnn:nnnn</i> , Read <i>nnnn</i> Expecting <i>nnnn</i>	
	297	Decreasing available memory	This message immediately follows any memory error message (above); informing you that memory modules are failing
270		Initialize extended BIOS data area	Not an error
250		Chipset initialization 7	Not an error
230		Enable hardware interrupts	Not an error
210		Read keyboard ID	Not an error
190	190	Real-time clock failure	The internal battery for the real-time clock is probably dead; contact your dealer
160	160	Coprocessor failed	Contact your dealer
150		Check for invalid configuration	Not an error
140	140	Shadow of system BIOS failed	Contact your dealer
135		Access window into SETUP	Not an error
130		Initialize diskette subsystem	When the system boots, this message remains on the screen for about ten seconds and then the system continues booting
	130	Diskette drive failure	Run SETUP or the ECU and check all connections; contact your dealer if the problem persists
	131	Diskette drive 0 failure	
	132	Diskette drive 1 failure	
120	120	Hard drive configuration error	Check your configuration and hard disk drive type by running SETUP or the ECU; contact your dealer if the problem persists

Power-on diagnostic and boot error messages (continued)

Countdown number	Error message number	Message	Solution
	121	Hard drive controller failure	Run SETUP or the ECU and check all connections; contact your dealer if the problem persists
	122	Hard drive 0 failure	
110		Chipset initialization 9	Not an error
090	090	Internal cache test failed—cache disabled	Contact your dealer
080	080	<i>nnnn</i> 0H optional ROM bad checksum= <i>nn</i> H	Correct the address conflict; contact your dealer if the problem persists
	083	Shadow of BIOS at C0000H-C7FFFH failed	Contact your dealer
	084	Shadow of BIOS at C8000H-CFFFFH failed	Contact your dealer
	085	Shadow of BIOS at E0000H-C7FFFH failed	Contact your dealer
070	070	Time of day clock not set	Run SETUP or the ECU and set the time and date
060	060	Keyboard is locked—please unlock	Unlock keyboard
040	040	Configuration error; slot <i>n</i>	Run the ECU; contact your dealer if the problem persists
	041	ID mismatch error; slot <i>n</i>	The board in slot <i>n</i> is bad or its ID does not match what the ECU expects; mismatch is due to the wrong board in slot <i>n</i> or the wrong configuration file for the board; run the ECU to configure slot <i>n</i> or, if necessary, replace the board; contact your dealer if the problem persists
	042	Invalid ISA configuration information	An ISA board is improperly configured; run the ECU and verify all jumper and switch settings
	043	Invalid EISA configuration information	An EISA board is improperly configured; run the ECU and verify all jumper and switch settings
	044	EISA configuration NOT ASSURED!	If you installed EISA option cards, this message appears the first time you boot your system after running SETUP; run the ECU to properly configure your system
020		Enable parity checking and NMI	Not an error
	000	Diskette read failure	There is no diskette in drive A; insert a diskette and try again; contact your dealer if the problem persists
	001	Not a bootable diskette	Remove the diskette from the drive and use a bootable diskette, or boot the system from the hard disk drive; contact your dealer if the problem persists
	002	No boot device available	Make sure you are using a bootable diskette or that your hard disk drive is formatted; contact your dealer if the problem persists

Power-on diagnostic and boot error messages (continued)

Countdown number	Error message number	Message	Solution
	003	Hard drive read failure	The hard disk drive may have failed; check your drive type by running SETUP or the ECU; check all cable connections; contact your dealer if the problem persists
	004	No boot sector on hard drive	The hard disk drive is not formatted as a bootable disk; format your hard disk as necessary; contact your dealer if the problem persists

Error Tone Codes

If power-on diagnostic tests detect an error but cannot display an error message, the computer sounds an error tone code. The tone code is a distinct pattern of beeps that identifies the error, such as one beep-two beeps-one beep. If the error is serious (fatal) the computer locks up, but if the error is not serious (non-fatal) you can continue using your computer.

The tables below list the fatal and non-fatal error codes.

Error tone codes for *fatal* errors

Error tone code	Description
I-1-3	Real-time clock write/read failure
I-1-4	ROM BIOS checksum failure
1-2-1	Programmable interval timer failure
I-2-2	DMA initialization failure
I-2-3	DMA page register write/read failure
1-3-1	RAM refresh verification failure
I-3-3	First 84KB RAM chip or data line failure (multi-bit)
I-3-4	First 84KB RAM odd/even logic failure
I-4-1	First 84KB RAM address line failure
I-4-2	First 84KB RAM parity test in progress failure
2-1-1	First 84KB RAM failure—bit 0
2-1-2	First 84KB RAM failure—bit 1
2-1-3	First 84KB RAM failure—bit 2
2-1-4	First 84KB RAM failure—bit 3
2-2-1	First 84KB RAM failure—bit 4
2-2-2	First 84KB RAM failure—bit 5
2-2-3	First 84KB RAM failure—bit 6
2-2-4	First 84KB RAM failure—bit 7
2-3-1	First 84KB RAM failure—bit 8
2-3-2	First 84KB RAM failure—bit 9
2-3-3	First 84KB RAM failure—bit A
2-3-4	First 84KB RAM failure—bit B
2-4-1	First 84KB RAM failure—bit C
2-4-2	First 84KB RAM failure—bit D
2-4-3	First 84KB RAM failure—bit E
2-4-4	First 84KB RAM failure—bit F
3-1-1	Slave DMA register failure
3-1-2	Master DMA register failure
3-1-3	Master interrupt mask register failure
3-1-4	Slave interrupt mask register failure
3-2-4	Keyboard/mouse controller test failure

Error tone codes for *non-fatal* errors

Error tone code	Description
3-3-4	Screen memory test failure
3-4-1	Screen initialization test failure
3-4-2	Screen retrace test failure

Hard Disk Drive Types

The following table lists the types of hard disk drives you can use in the computer. Check this table and the documentation supplied with your hard disk to find the correct number for the type of hard disk drive(s) installed in your computer. You need to enter this number when you set the hard disk drive configuration in the SETUP program.

Hard disk drive types

Type	Cyl	Hd	Pre	LZ	Sect	Size
01	610	4	-1	888	17	20MB
02, 03	—	—	—	—	—	User-definable
04	940	8	1512	940	17	82MB
05	940	6	1512	940	17	48MB
08	820	10	-1	0	17	88MB
07	918	15	-1	0	17	114MB
08	—	—	—	—	—	Unused
09	900	15	-1	901	17	112MB
10	977	5	0	978	17	40MB
11	855	5	-1	855	17	35MB
12	855	7	-1	855	17	49MB
13	—	—	—	—	—	Unused
14	733	7	-1	733	17	42MB
16	615	4	-1	0	17	20MB
17	—	—	—	—	—	Unused
18	977	7	-1	977	17	56MB
19	1024	7	1512	1023	17	59MB
20	814	9	-1	814	32	114MB
21	1988	10	-1	968	34	160MB
22	873	3	-1	873	36	199MB
23	838	18	-1	837	63	313MB
24	830	10	-1	830	26	105MB
25	1751	8	-1	1	17	49MB
26	755	16	-1	1	17	100MB
27	1024	5	-1	1023	17	42MB
28	1024	8	-1	1023	17	68MB
29	584	16	-1	584	32	146MB
30	311	16	-1	312	63	153MB
31	989	5	0	989	17	41MB
32	—	—	—	—	—	Unused
33	985	5	-1	1	17	40MB
34	965	10	-1	1	17	80MB
35	1024	9	-1	1024	17	78MB
36	—	—	—	—	—	Unused
37	830	10	-1	830	17	68MB
38	832	6	-1	832	33	80MB
39	776	8	-1	776	33	100MB
40	615	8	128	664	17	40MB
41	917	15	-1	918	17	114MB
42	1023	15	-1	1024	17	127MB
43	—	—	—	—	—	Unused
44	820	6	-1	820	17	40MB
45	—	—	—	—	—	Unused
46	925	9	-1	925	17	69MB
47	699	7	256	700	17	40MB
48, 49	—	—	—	—	—	User-definable

Installation/Support Tips

System Power Requirements

The power cord must be rated for at least 125% of the current rating of the AC voltage system and must be less than 4.5 meters (14.76 feet) long to comply with the system's safety requirements. Do not use or attempt to modify the supplied AC power cord if it is not the type required for use in your region.

To avoid permanent damage to the computer, be sure the voltage selector switch is set to the correct input line voltage before you turn on the power. The computer is shipped with the voltage selector switch set to 115 VAC, which is appropriate for line source voltages between 100 and 120 VAC. If the line source voltage in your location is between 200 and 240 VAC, make sure you set the switch to 230 VAC.

Keyboard and Monitor

Even if you intend to use this system as a network file server, you need to connect a monitor and a keyboard to complete the installation. You may remove them once the installation is complete.

Mouse and Keyboard

When connecting the mouse and keyboard, be careful to plug them into the proper ports. Although they are physically identical, they are not interchangeable, and damage may occur to the ports or the main system board.

Option Cards

The order in which you install option cards depends on the type of cards you have. If you install only ISA option cards that do not have their own configuration files, install them before you connect your peripheral devices. Follow the instructions in your ISA card manual to set the card's switches or jumpers for your system.

Also install any EISA cards you plan to use before you connect peripheral devices so your EISA Configuration utility can automatically detect the cards and configure them correctly.

If you install ISA cards that came with their own configuration (CFG) files, install them after you have connected the necessary peripheral devices and run the computer's EISA Configuration utility. This allows you to add the CFG file information to your configuration so the program can give you the card's correct jumper and switch settings. Then you can set the switches and jumpers and install the card. See the documentation that came with your card(s) for more information.

SETUP

Use the SETUP program in your system's BIOS ROM to configure your computer if you installed only ISA option cards that did not come with CGF files or you do not have a diskette drive or you have disabled the diskette drive.

Run the EISA Configuration utility on the Reference diskette to configure your system if you have installed EISA option cards or you have installed an ISA option card that came with a configuration file.

Information Reference List

Engineering Change Notices

None.

Technical Information Bulletins

None.

Product Support Bulletins

None.

Related Documentation

TM-PSPAN	Epson PowerSpan Service Manual
PL-PSPAN	Epson PowerSpan Parts Price List
400234300	Epson PowerSpan User's Guide